Trace Metal and Nutrient Loads from Groundwater Seepage into the South Fork Coeur d'Alene River

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The Coeur d'Alene mining district is a globally important source of lead, zinc, and silver, but more than 100 years of mining has left a legacy of metals contamination in the Coeur d'Alene River valley. Previous studies by the U.S. Geological Survey (USGS) and others have indicated that groundwater seeping (discharging) into the South Fork Coeur d'Alene River between Kellogg and Smelterville is a significant source of dissolved zinc and cadmium and total phosphorus. Therefore, as part of its ongoing cleanup efforts, the U.S. Environmental Protection Agency (EPA) is working with contractors to install a system to intercept and treat this contaminated groundwater before it reaches the river.

To establish baseline conditions prior to the start of construction, the USGS, in cooperation with the EPA, conducted a seepage study to quantify the rate and quality of groundwater seeping into the South Fork Coeur d'Alene River between Kellogg and Smelterville. Repeated measurements of streamflow were taken at multiple locations in the river and tributaries, and water-quality samples were collected and analyzed for trace metals and nutrients.

Results are congruent with earlier studies and show consistent gains in streamflow, dissolved zinc and cadmium, and total phosphorus concentrations and loads in a discrete portion of the reach between Kellogg and Smelterville. These gains exceed tributary inputs, thereby implicating groundwater seepage as the main source of loading in the reach. A second seepage study will be conducted after construction and system optimization is complete to evaluate changes in groundwater seepage to and water quality in the South Fork Coeur d'Alene River compared to the pre-construction baseline.